Making Community Groundwater Protection Efforts More Effective

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NH DES
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A Call to Act…

- ✓ **Growth is driving the need for groundwater protection in NH**
- ✓ **Environmental & economic rationales support groundwater protection**

- ✓ **Municipalities are key players in land use decisions and groundwater protection**

Key Groundwater Management Objective

- Maximize clean recharge, prevent release of contaminants from land use activities and ensure long-term sustainability of sources of drinking water.

Standards: Ambient groundwater quality standards (for contaminants)

Drinking water quality standard
http://des.nh.gov/rules/env-ws310316.pdf

The *New* Groundwater Model Ordinance (2006)

Update to a 2001 DES/OSP model

- ✓ Update focused on measurable standards, more detailed plans, source controls
- ✓ Model language includes groundwater protection BMPs (i.e. performance standards)
- ✓ Provides guidance/resources/info to support its adoption

Online at www.des.nh.gov/dwspp

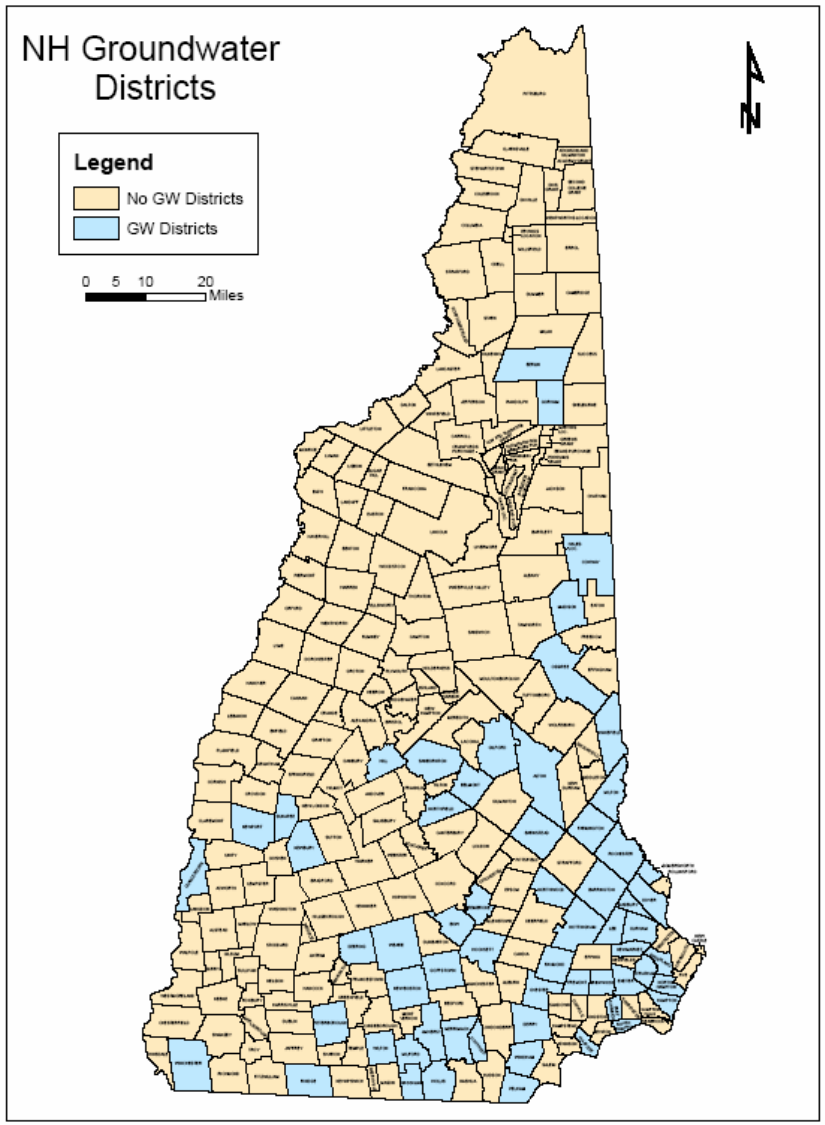
Model Ordinance: Local Authority

- ✓ RSA 674:2 (natural resource plan) and 674:17,I is often cited for local authority to protect groundwater
- ✓ RSAs 31:39 and 147 give broad authority to towns to protect health, welfare and public safety.
- ✓ Model cites RSA 674:16 relative to innovative land uses

Authority

Purpose
Definitions
District Boundary
Applicability
Perform. Standards
Permitted Uses
Prohibited Uses
Conditional Uses
Non-Conforming
Exemptions
Maint. & Inspection

Approximately 70 Communities with Groundwater/Aquifer Protection Districts



2006 Model Ordinance: Purpose

- ✓ **Protect public health**
- ✓ **Meet and maintain the Ambient Groundwater Quality Standards, per RSA 485-C:6**
- ✓ **Achieve sustainable water supply**

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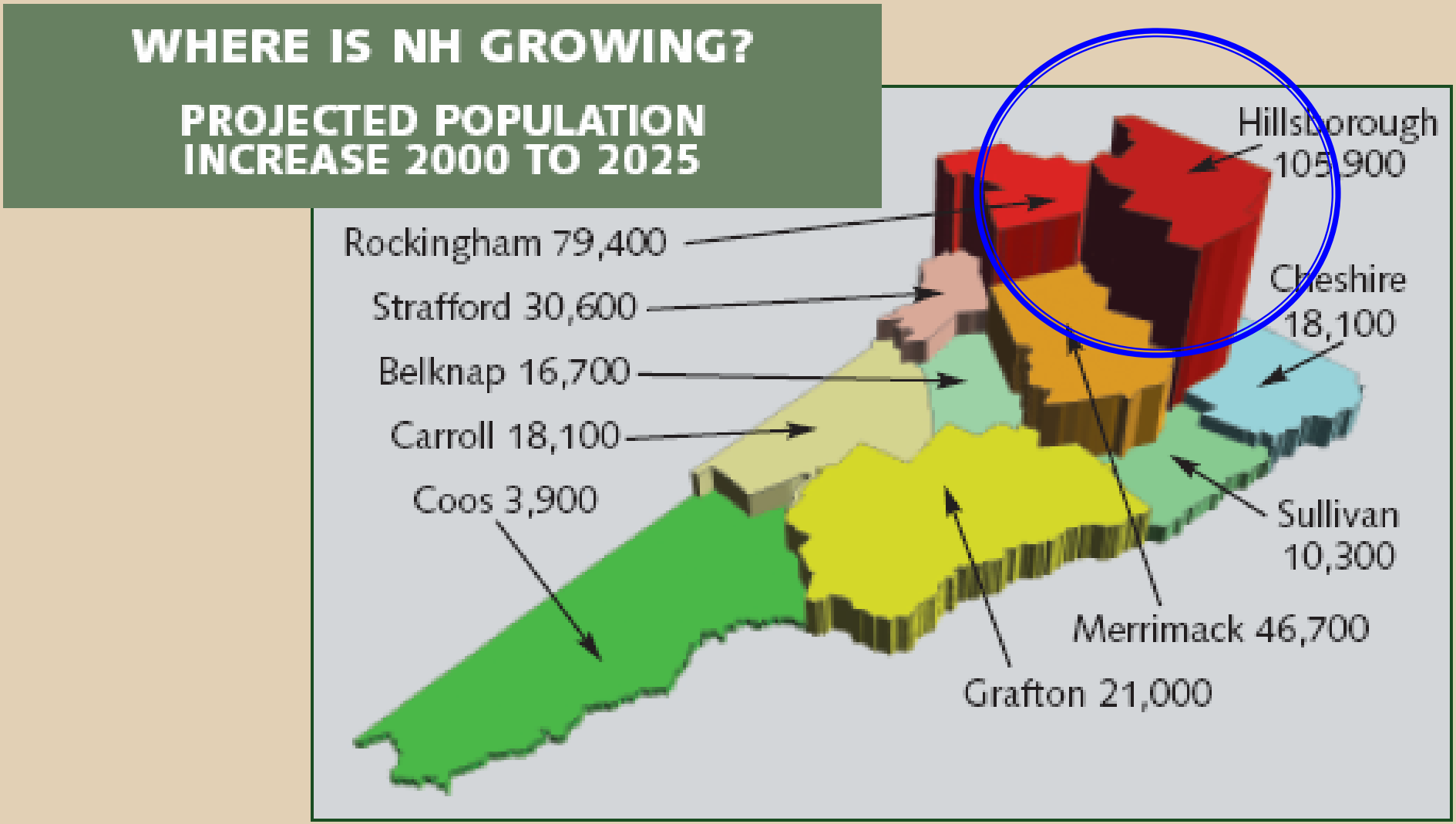
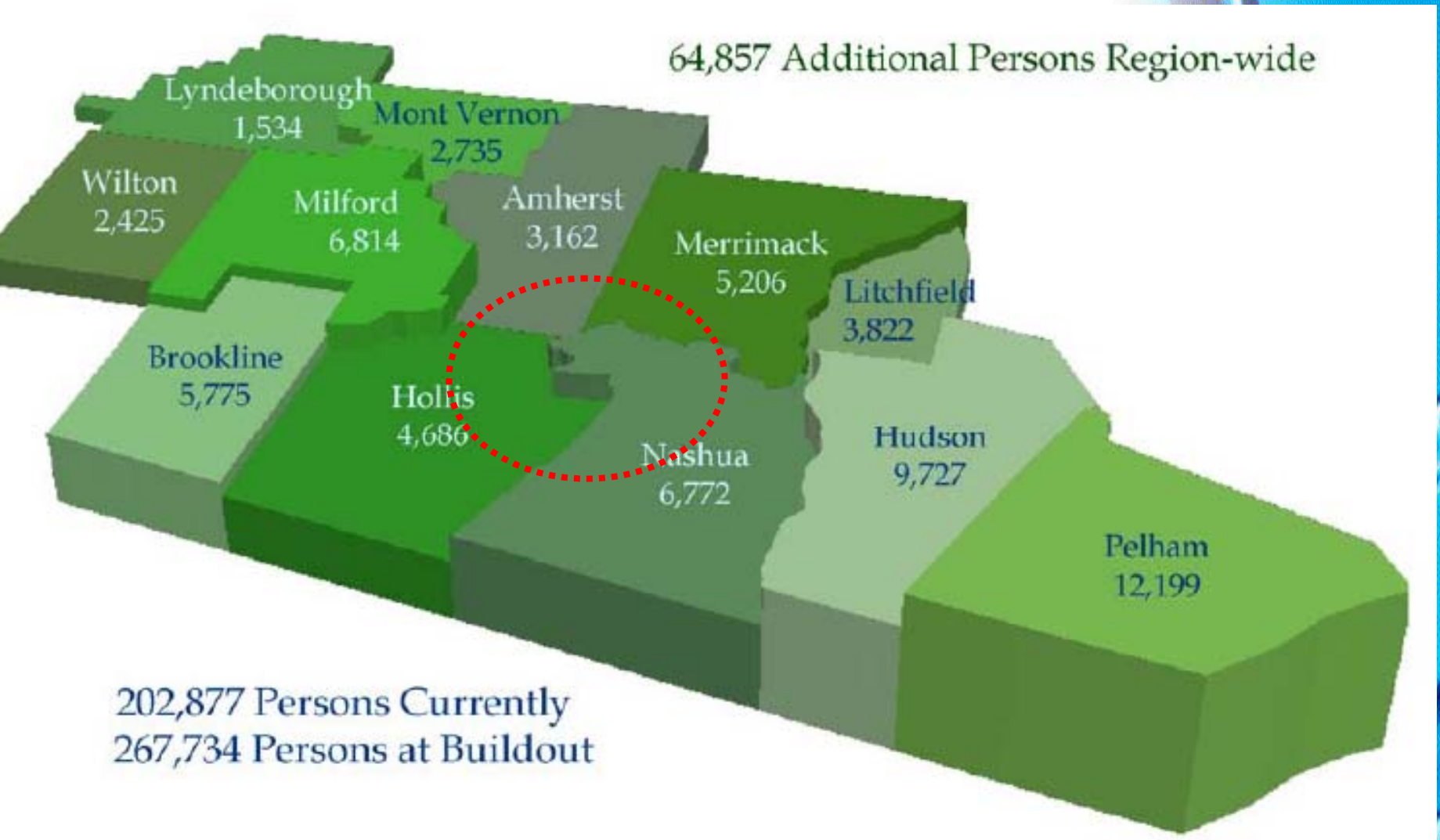
NH is A Rapidly Growing State
80% of the growth is projected for 4 counties

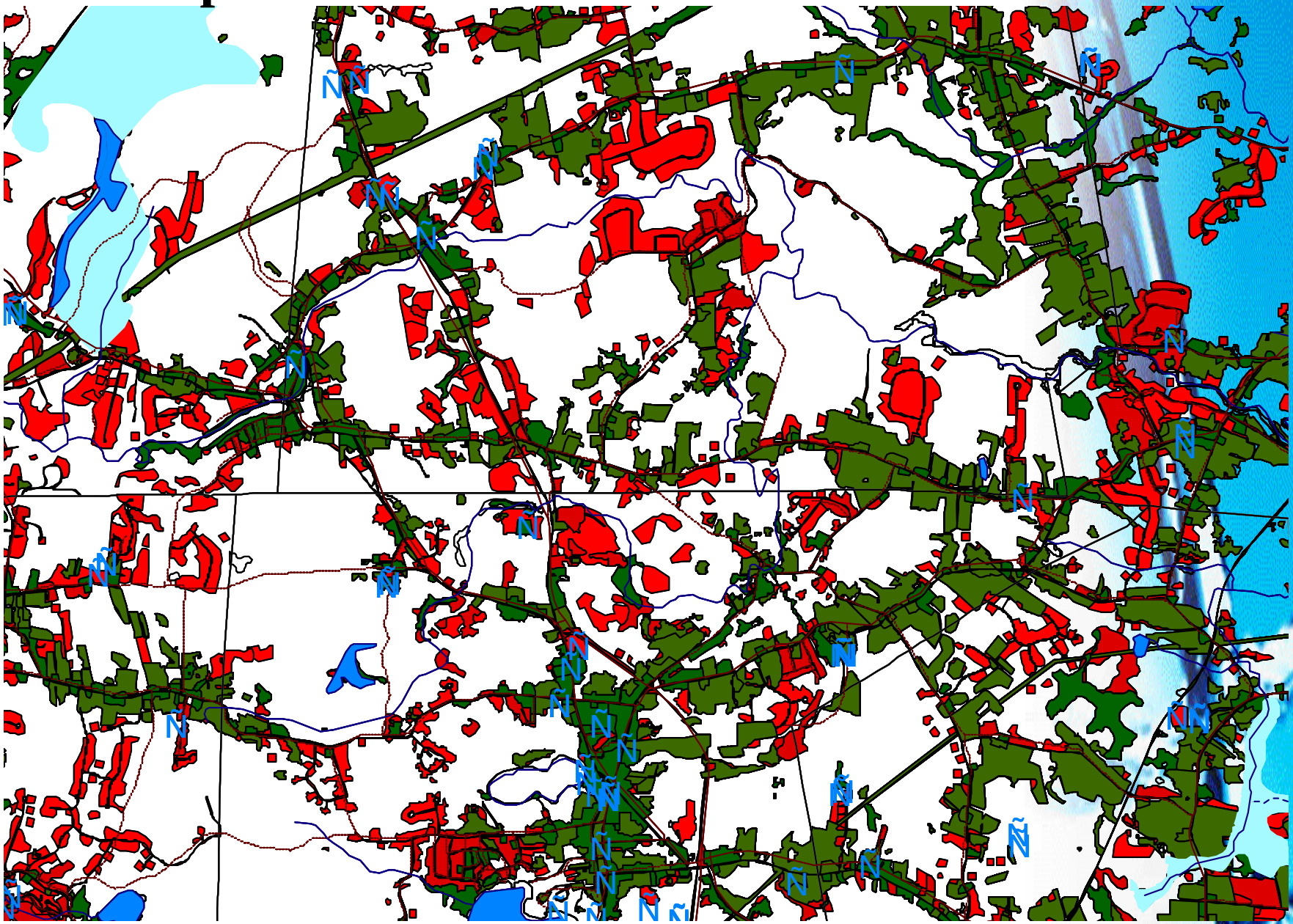


Source: NHOEP and SPNHF

Nashua Region: Additional Population @ Buildout: 64,857



Developed Lands: 1962 1974 1998



Rockingham County, UNH Granit

Growth Increases Risk of Potential Contamination:

Chemical spills, spreading or spraying

Sprawl or urban cover

Contaminated stormwater

Poor Management

DES "Source Assessment" of existing threats to public water systems See www.des.nh.gov/dwspp

Contamination may incur significant costs

Case: Savage Well, Milford

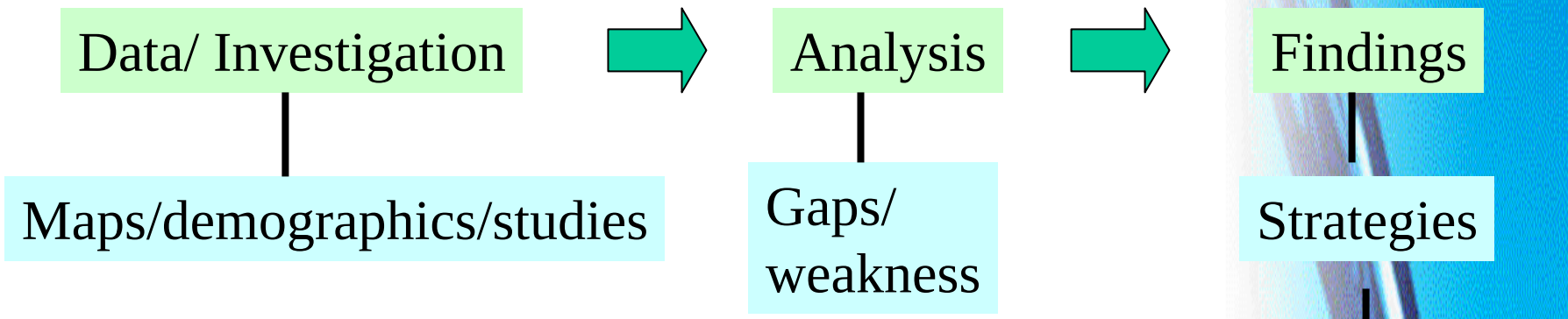
1. New municipal water supply ($)
2. Capital cost $2.4 million, $1.4 million in operating costs per year.
3. Reduced economic re-development
4. Reduced value and opportunity of future water supply

Threats to Groundwater

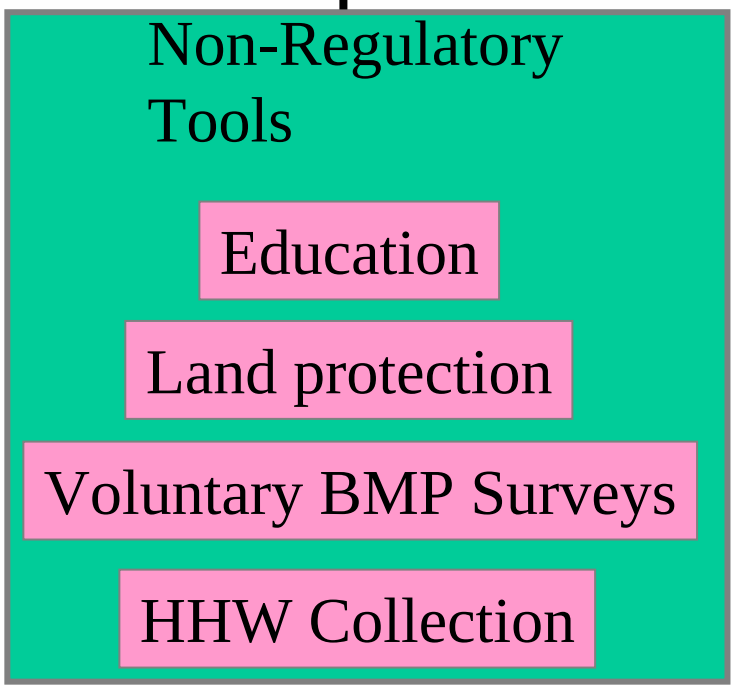
- **Changing land use – Growth**
  - Stormwater (untreated, reduced recharge)
  - High Risk land uses
  - Suburbanization/Sprawl (e.g. pesticide/fertilizer use, withdrawals)
- **Threats identified in DES Source Assessments**
  - Potential Contamination Sources
  - Sanitary Radius Deficiencies
  - Septic Systems
  - Highways and Railroads
  - Urban Land Cover

Prioritize and develop protection strategies

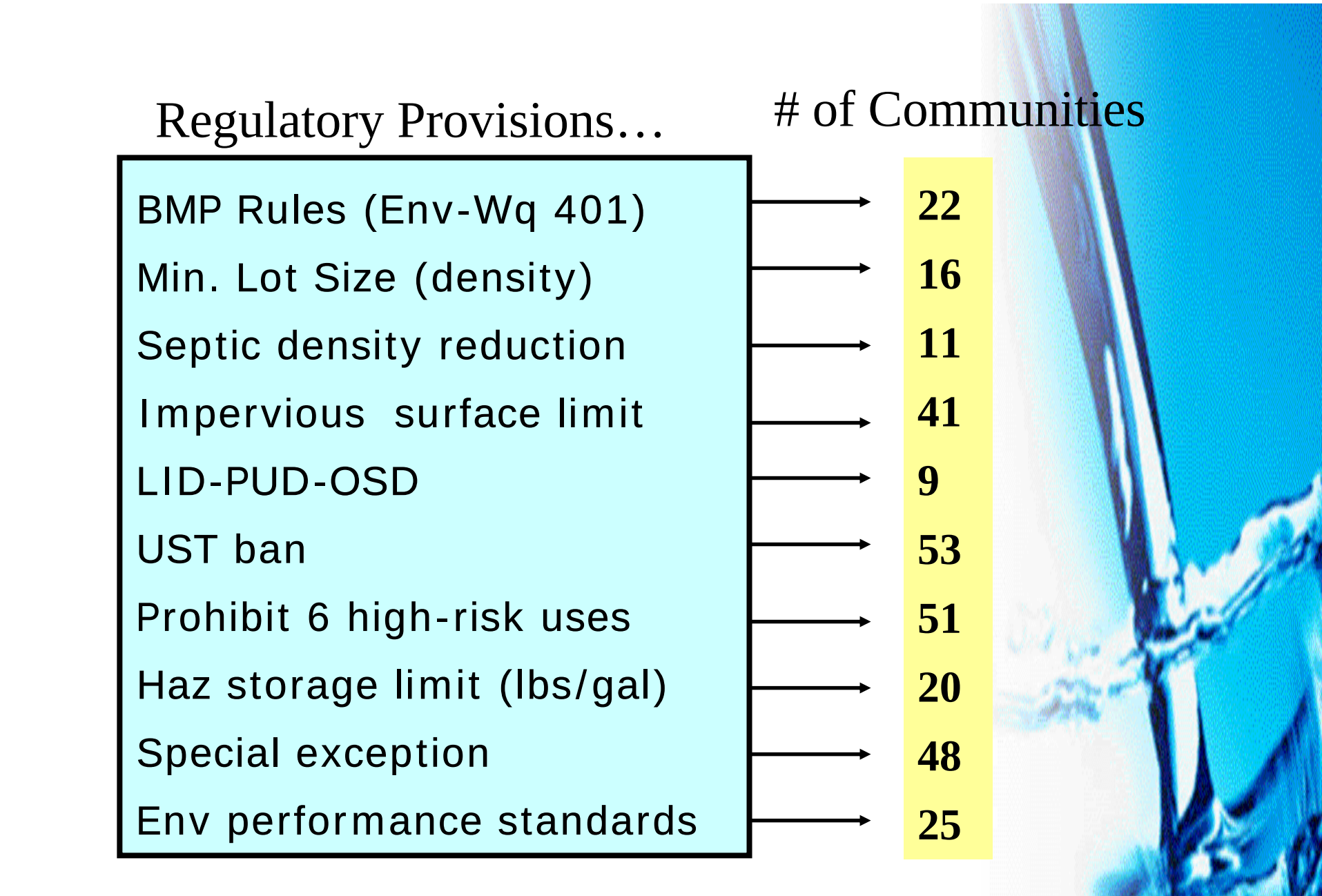
Protection Incurs Less Cost



Combine Tools to Form Approach



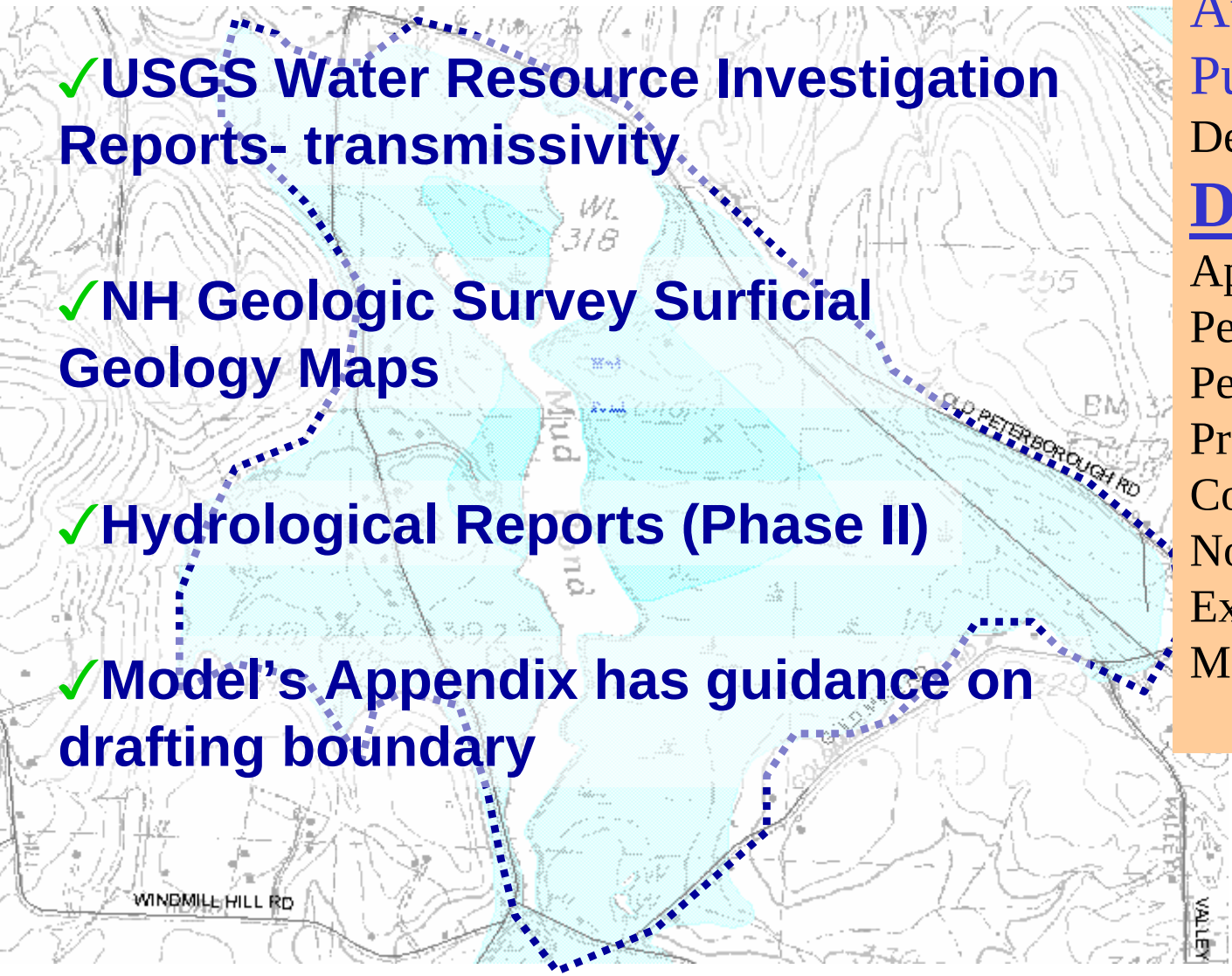
Protections Applied to Groundwater (locally)



Regulatory Provisions…	# of Communities
BMP Rules (Env-Wq 401)	22
Min. Lot Size (density)	16
Septic density reduction	11
Impervious surface limit	41
LID-PUD-OSD	9
UST ban	53
Prohibit 6 high-risk uses	51
Haz storage limit (lbs/gal)	20
Special exception	48
Env performance standards	25

Model Ordinance: Use Most Defensible & Accurate Groundwater Resource Boundary

- ✓**USGS Water Resource Investigation Reports- transmissivity**
- ✓**NH Geologic Survey Surficial Geology Maps**
- ✓**Hydrological Reports (Phase II)**
- ✓**Model's Appendix has guidance on drafting boundary**



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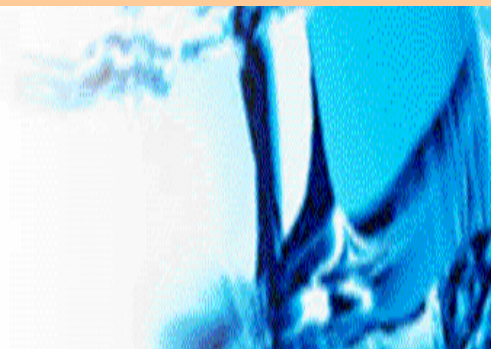

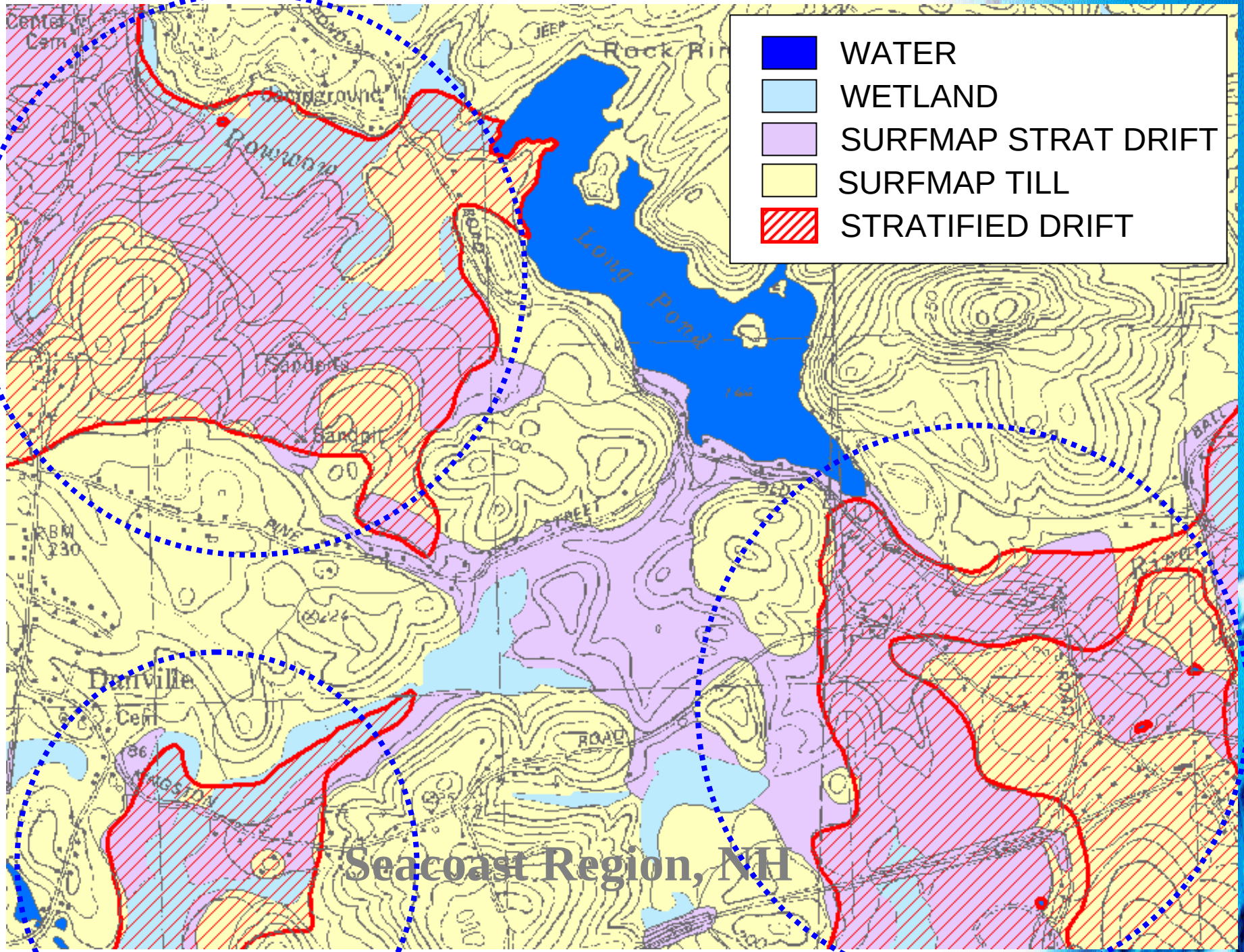

Seacoast Region, NH

Model Ordinance: Prohibit High Risk Uses

✓ Model now prohibits eight high-risk uses (including gas stations)

Factsheet: http://www.des.nh.gov/factsheets/ws/ws-22-20.htm

✓ Uses that cannot control exposure of *regulated substances* to precipitation

✓*"BMPs can reduce but not eliminate pollutant loadings of common stormwater pollutants".*

(Am J Public Health. 2003 September; 93(9): 1527–1533.)

Prohibiting Uses Is Related To Local Oversight

Short list with emphasis on local oversight (8 in model)

Longer list with less local oversight (Appendix C)

"High-load" activities (MA, CT)

1. Hazardous waste disposal site
2. Solid waste disposal site
3. Outdoor road salt or deicing chemicals
4. Junkyard
5. Snow dumps
6. Wastewater or septage lagoon
7. Petroleum bulk plants/terminals
8. Gasoline station

Prohibit uses not effectively controlled through BMPs

Model Ordinance: Performance Based Controls

- Model requires "Source Controls" to separate regulated substances from precipitation

- Model requires stormwater pollution prevention plans (SWPPP)

- Prohibits infiltration through contaminated areas.

- Requires Env-Wq 401 Groundwater Protection BMPs

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Performance standards… measurable, verifiable.

"Source Controls" Prevent Exposure of Regulated Substances through…

Separation… Of regulated substances from precipitation

Treatment… Removal, sequestration of expected pollutants

And

Reduction… Disconnection, dispersed infiltration

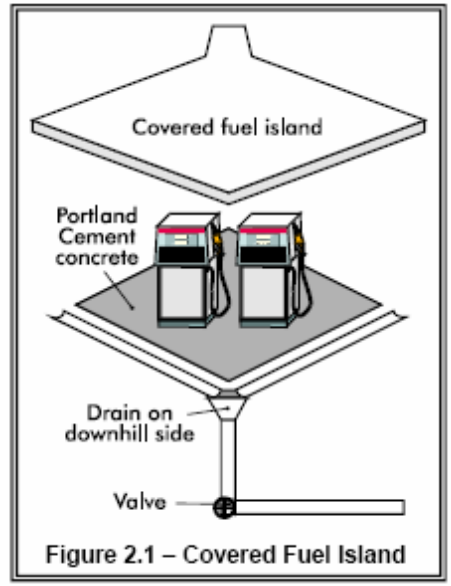


Figure 2.1 – Covered Fuel Island

"Few (stormwater) pollutants ever disappear from the urban landscape." (R.Pitt, 1994)

Source Controls Are Simple

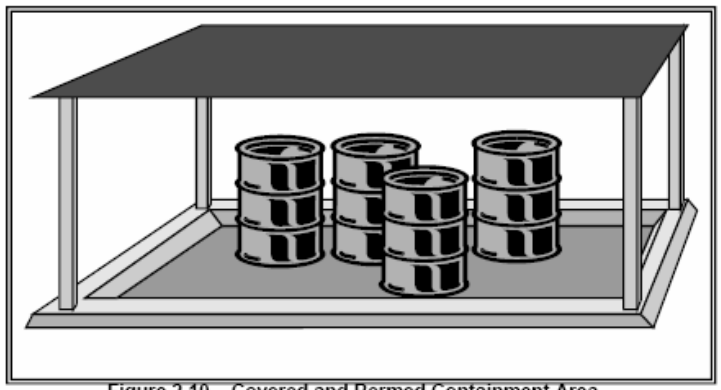


Figure 2.10 – Covered and Bermed Containment Area

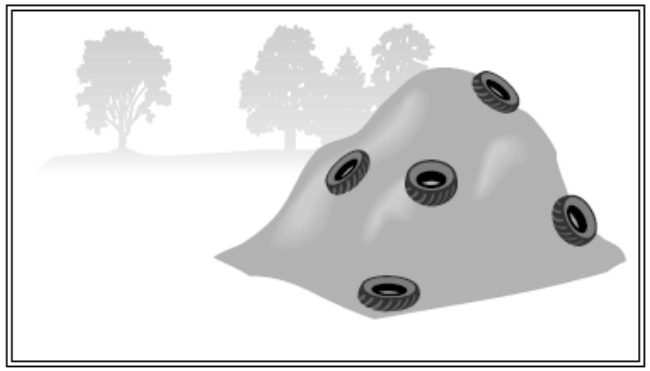


Figure 2.14 – Material Covered with Plastic Sheeting

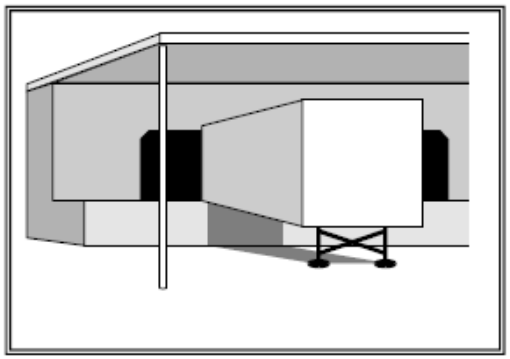


Figure 2.5 – Loading Dock with Overhang

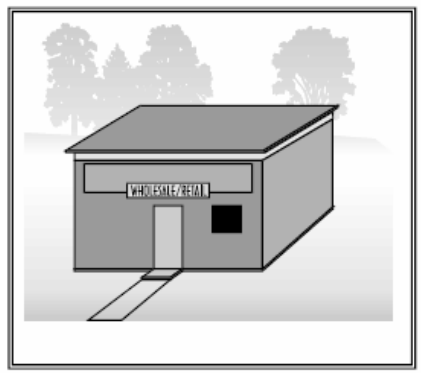


Figure 2.6 – Enclose the Activity

…and within the model's language

Photo Source: http://www.ecy.wa.gov/pubs/0510032.pdf

Stormwater Treatment can be Complex

Stormwater Constituents with High Potential to Contaminate Groundwater
(Adapted from Pitt, 1994)

Pollutant	Control or Treatment
Nutrients	Slow release fertilizers
Pesticides	Short half-life; Pretreatment to trap sediments
Organics	Source controls; deep organic soils
Microorganisms	Treatment in soil layer
Metals	Sedimentation pretreatment
Salts	Source controls

Model Defines Content of Stormwater Pollution Prevent Plan (conditional uses)

Locate outfalls, discharge points

Show drainage to outfall

Stormwater BMPs

Exposed materials

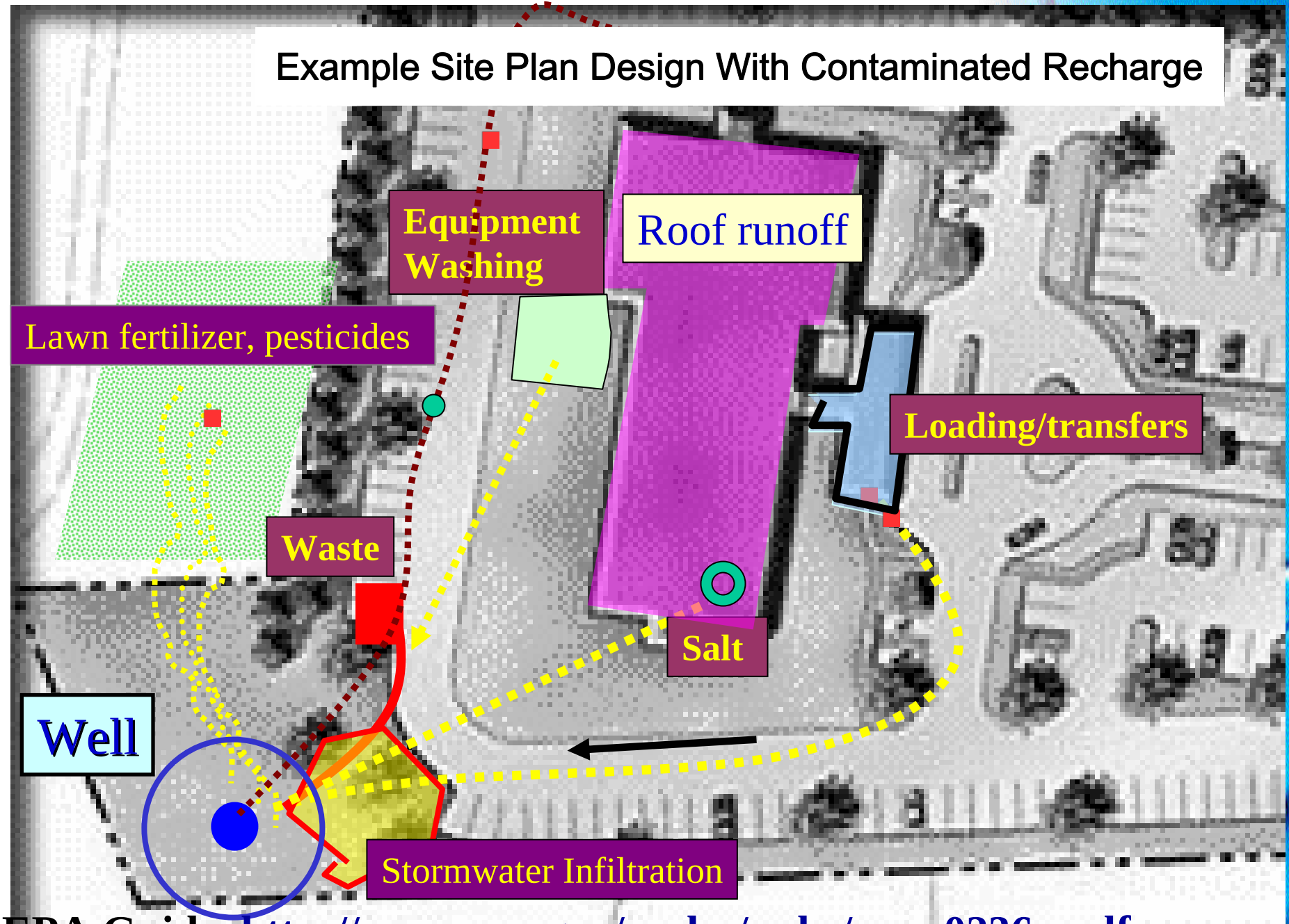
Past spills, contamination

High-risk activity areas

(Adapted from EPA SWPPP Guidance, 1992)

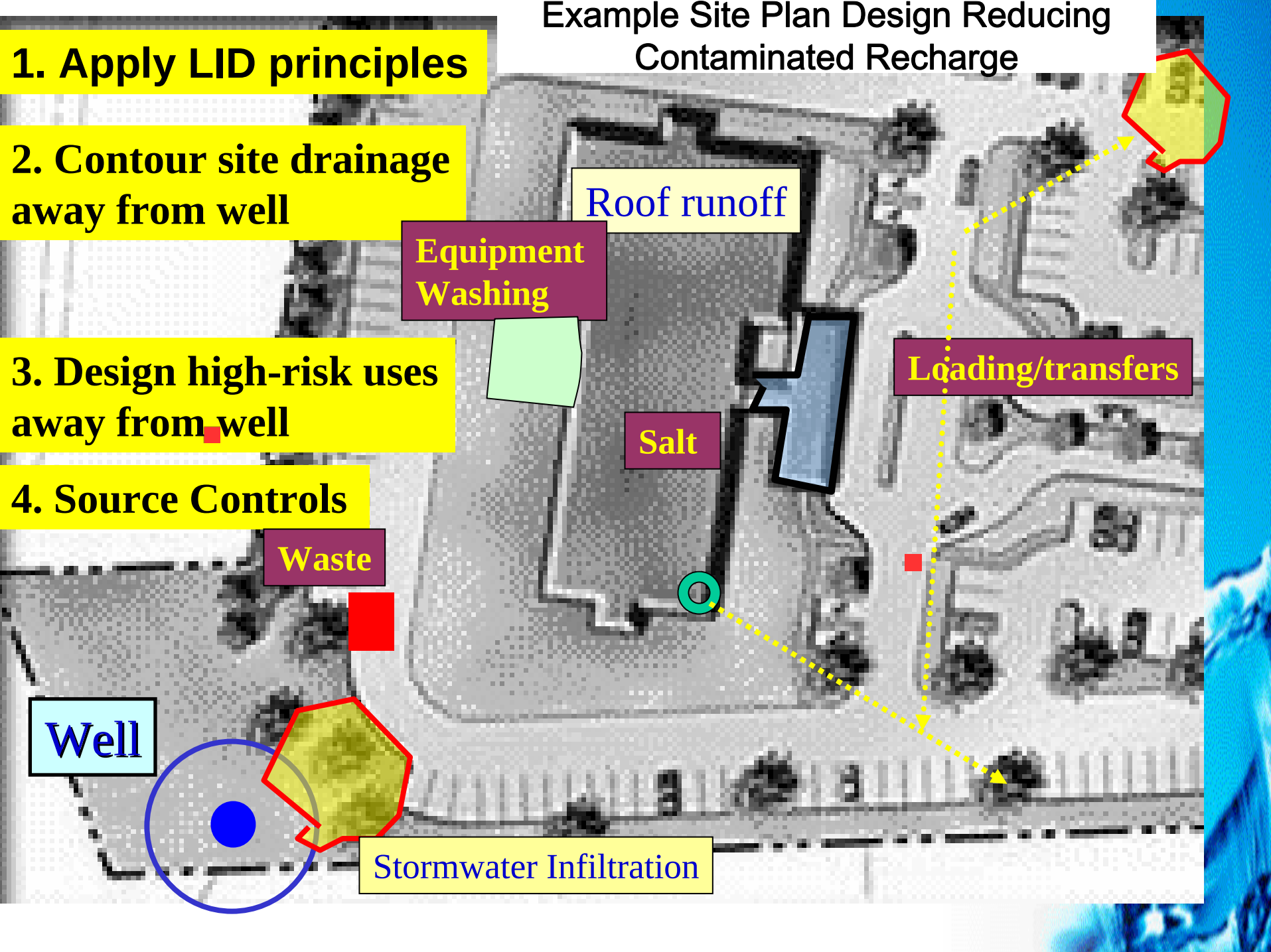
www.stormwaterauthority.org/

Water Supply Area (wellhead protection areas, aquifers)



EPA Guide http://www.epa.gov/npdes/pubs/owm0236a.pdf

Example Site Plan Design Reducing Contaminated Recharge



Unexpected Risks: Spill Prevention, Control and Countermeasures Plan

- ✓ 875 DES documented spills / releases (fires, truck-AST accidents, leaking ASTs, etc.)
- ✓ DES Model (Article VII) requires SPCC plan for conditional uses > 100 gallons or 800 lbs of a regulated substance on-site.
- ✓ Extends local review of SPCC when > 100 gallons (not 660 gallons under DES rules)

DES Web on SPCCs http://www.des.nh.gov/orcb/doclist/spcc.pdf

Take Home Points

- ✓ Plan growth to maximize clean recharge and minimize contaminants to protect public health
- ✓ Contamination limits growth, treatment is complex and can result in long-term community liabilities
- ✓ Prohibit uses with potential contaminants that cannot be managed through BMPs

More Take Home Points

- ✓ Source controls and stormwater plans should minimize releases of regulated substances
  http://www.ecy.wa.gov/pubs/0510032.pdf

- ✓ Apply LID techniques and infiltrate on-site to the extent possible
  http://www.lid-stormwater.net/intro/homedesign.htm

- ✓ Infiltrate stormwater through systems proven to eliminate or effectively reduce expected or identified pollutants. See national BMP performance data http://www.bmpdatabase.org/background.htm

Source Water Protection Program

- Guidance, training, and technical assistance
- SWP grants
- Land conservation grants
- Chemical monitoring waivers
- Water system security
- *The Source* newsletter
- Youth education
- New community well approval
- Large groundwater withdrawals
- Water conservation
- Groundwater discharge permits
- UIC registration

Web Address: www.des.nh.gov/dwspp

Good Groundwater/Aquifer Districts

Newmarket

http://www.newmarketnh.gov/town_departments/planning/index.htm

Raymond

http://www.raymond-nh.com/html/planning___community_developme.html

Exeter

http://town.exeter.nh.us/

Hollis

http://www.hollis.nh.us/Regulations/HZO2005.pdf